END OF COURSE ALGEBRA I

LARGE PRINT FORM

Property of the Virginia Department of Education

DIRECTIONS

Read and solve each question. Then mark the space on the answer sheet for the best answer. For this test you may assume that the value of a denominator is not zero.
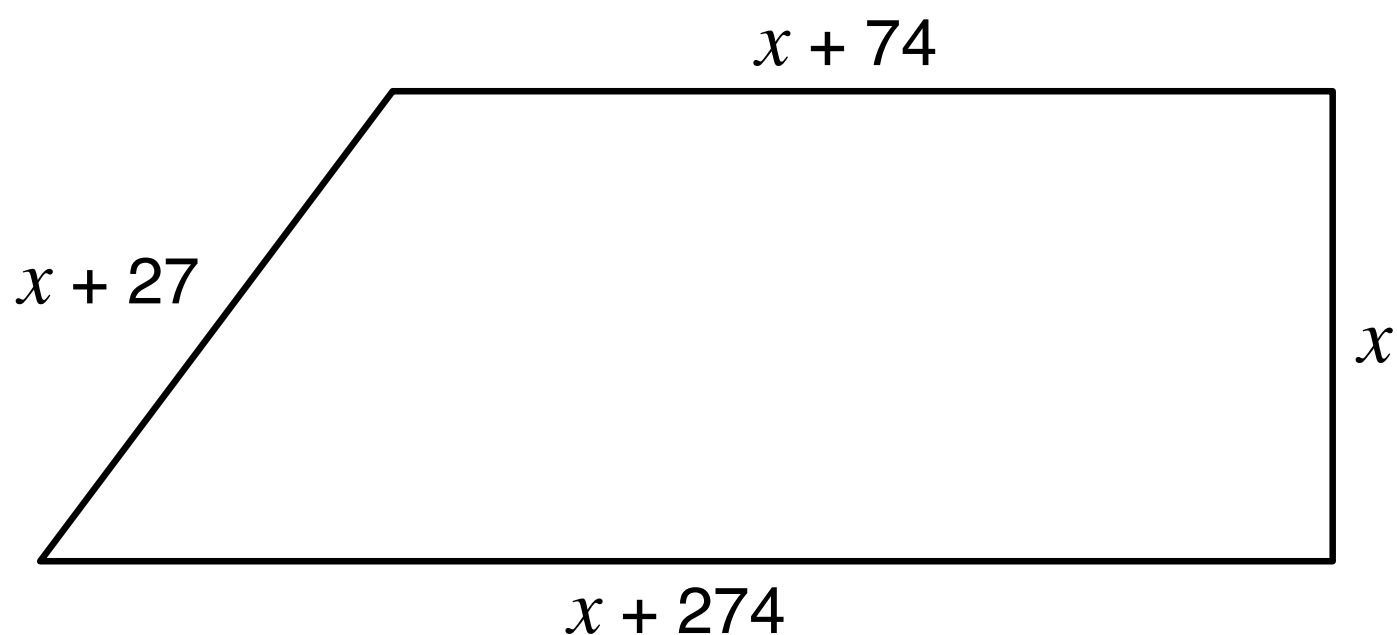
SAMPLE

Which shows $y = 2x + 4$ in completely factored form?

A $y = 2(x + 4)$

B $y = (x + 2)^2$

C $y = 2(x + 2)$

D $y = (x + 2)(x - 2)$

1 What is the solution to $3(x - 5) \geq 12$?

A $x \leq 1$

B $x \geq {}^-1$

C $x \geq \dfrac{17}{3}$

D $x \geq 9$

2

$x + 74$

$x + 27$

x

$x + 274$

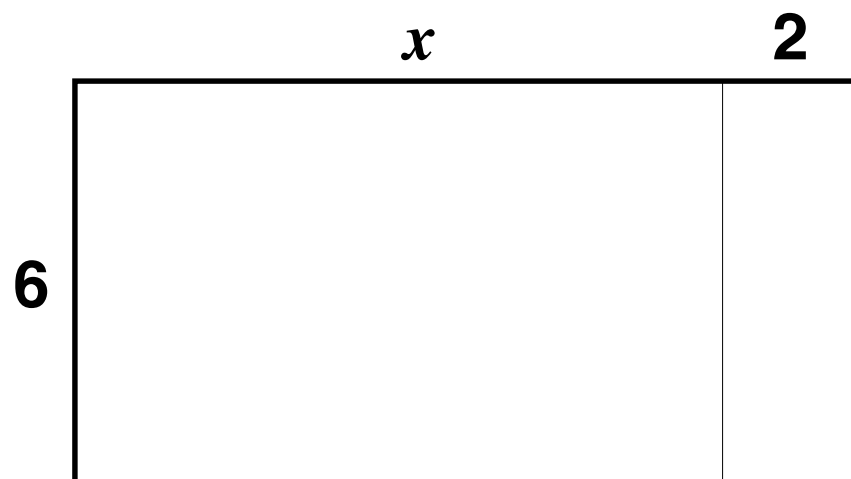**Tambria's property has the shape of a trapezoid with the dimensions shown. If the perimeter of the property is 3,279 feet, what is the value of *x*?**

F   726 ft

G   781.25 ft

H   913.5 ft

J   1,452 ft

3

$$x \qquad 2$$

$$6$$

Which expression correctly represents the area of the rectangle?

A $8x$

B $6(x + 2)$

C $(x + 2)(x + 6)$

D $x^2 + 2$

4 **What is the value of $3x^2 - y^2$ if $x = {}^-1$ and $y = 3$?**

  F **12**

  G **$^-3$**

  H **$^-6$**

  J **$^-12$**

5 Which property of real numbers is utilized by rewriting $11x + 5xy$ as $x(11 + 5y)$?

    A Associative property for addition

    B Commutative property for addition

    C Closure property for multiplication

    D Distributive property for multiplication over addition

GO ON

6 If $a < b$, which of the following statements CANNOT
be true?

F $a + c < b + c$

G $a - c < b - c$

H $ac < bc$

J $^-a < {}^-b$

7 Matrix A shows the cost per pound of apples and oranges at three different markets during the first week of September.

$$\begin{array}{c} \qquad\quad \textbf{GoGo} \quad \textbf{Alto} \quad \textbf{A\&B} \\ \begin{array}{c} \textbf{apples} \\ \textbf{oranges} \end{array} \begin{bmatrix} 1.09 & 1.11 & 0.89 \\ 1.15 & 1.11 & 0.79 \end{bmatrix} = \textbf{A} \end{array}$$

Matrix B shows the prices one week later at the same three markets.

$$\begin{array}{c} \qquad\quad \textbf{GoGo} \quad \textbf{Alto} \quad \textbf{A\&B} \\ \begin{array}{c} \textbf{apples} \\ \textbf{oranges} \end{array} \begin{bmatrix} 1.09 & 1.14 & 0.49 \\ 1.19 & 1.14 & 0.89 \end{bmatrix} = \textbf{B} \end{array}$$

Which matrix on the next page correctly shows the difference in prices, B − A?

A $\begin{bmatrix} 0 & 0.03 & {}^-0.40 \\ 0.04 & 0.03 & 0.10 \end{bmatrix}$

B $\begin{bmatrix} 0.06 & 0 & {}^-0.10 \\ 0.10 & 0 & 0.40 \end{bmatrix}$

C $\begin{bmatrix} 0 & 0.03 & 0.40 \\ 0.04 & 0.03 & 0.10 \end{bmatrix}$

D $\begin{bmatrix} 2.18 & 2.25 & 1.38 \\ 2.34 & 2.25 & 1.68 \end{bmatrix}$

8 The chart shows how the wholesale price of an item, *p*, depends on the cost of the materials needed to produce the item, *m*. Which equation represents this relationship?

p	$4.00	$5.00	$6.00	$7.00
m	$0.50	$1.00	$1.50	$2.00

F $p = m + 3.5$

G $p = 2m + 3$

H $p = 3m + 2.5$

J $p = 4m + 2$

9 **In which table are all the points represented by the equation** $y = \dfrac{^-x}{4} + 2$**?**

A

x	0	2	6	8
y	2	1	$\dfrac{1}{2}$	0

B

x	0	4	6	8
y	2	1	$\dfrac{1}{2}$	0

C

x	0	4	6	8
y	2	1	0	-1

D

x	0	2	4	6
y	2	1	0	$\dfrac{-1}{2}$

10

x	−6	2	10
y	1	3	5

Which equation is satisfied by all the points in the table?

F $x - 4y = 10$

G $4y - x = 10$

H $7y - x = 20$

J $x - 7y = 20$

11 Which of the following tables represents a function?

A

x	y
4	-2
4	0
4	2
4	4

B

x	y
1	-2
0	0
1	2
4	3

C

x	y
-1	1
0	0
1	1
2	4

D

x	y
2	-4
0	2
2	6
4	8

12   Which of these data sets represents a function?

F

G

H

J

GO ON
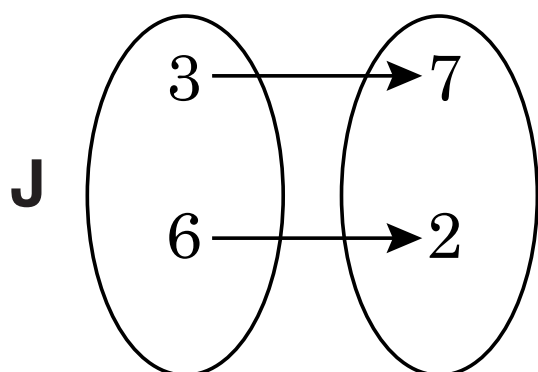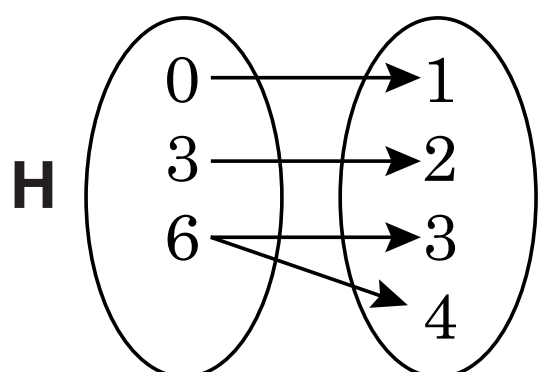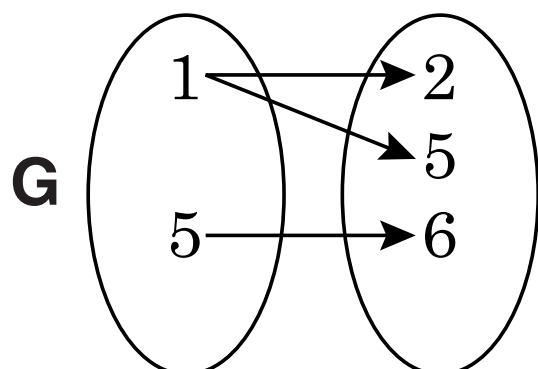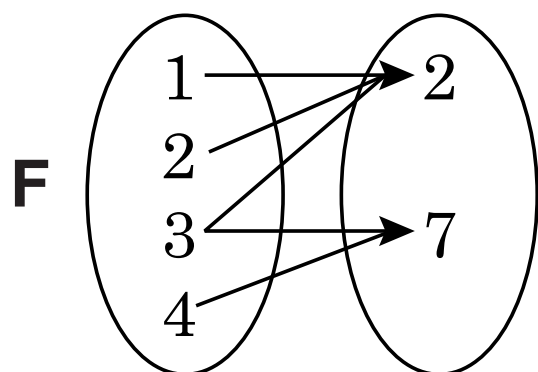
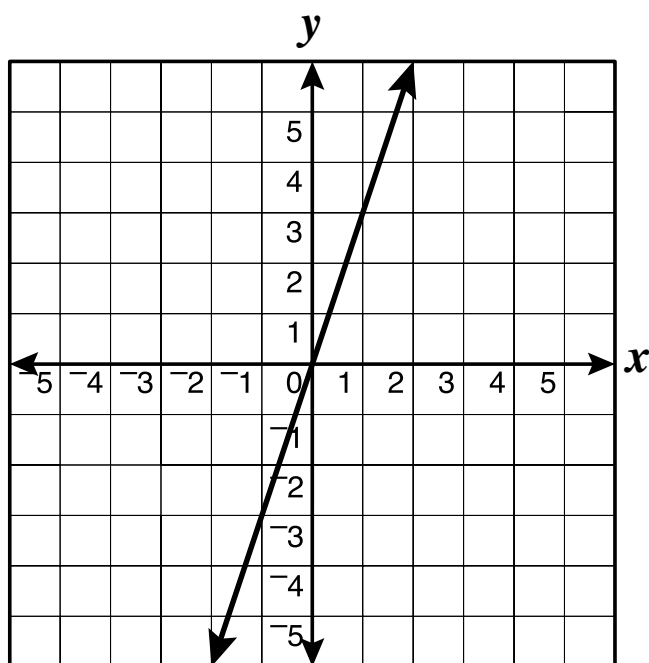**13 Which equation is represented by this line?**
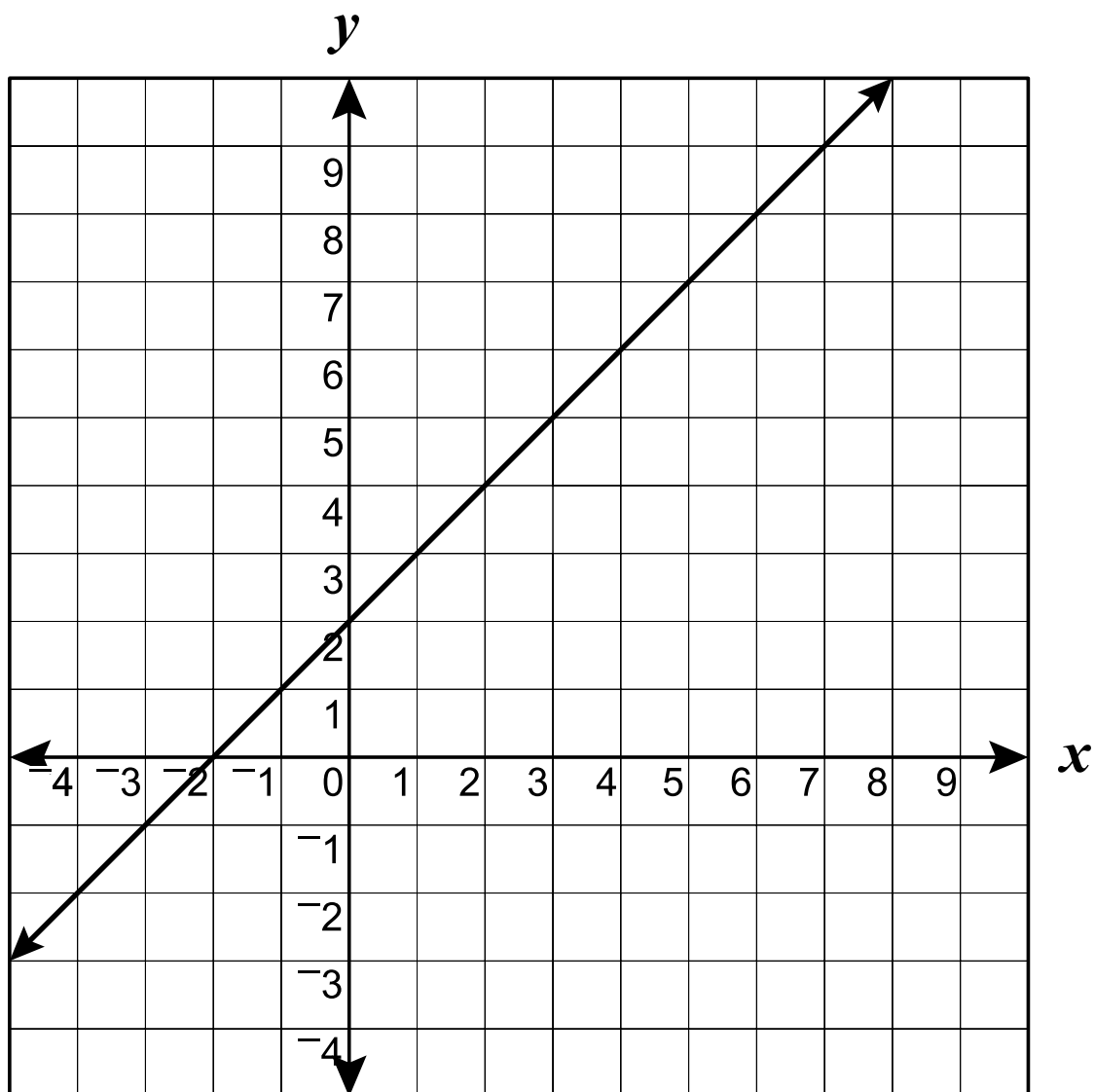
A $y = x - 2$

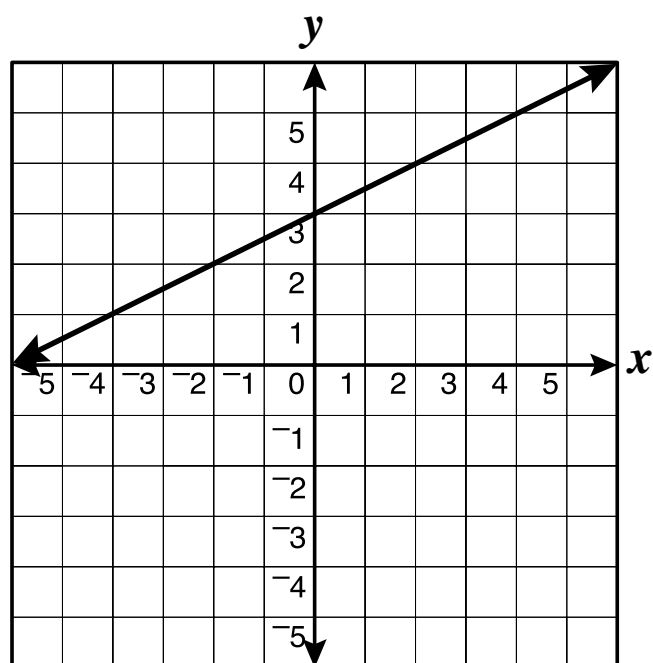**B** $y = \dfrac{x}{2} + 2$

C $y = x + 2$

D $y = 2x + 2$

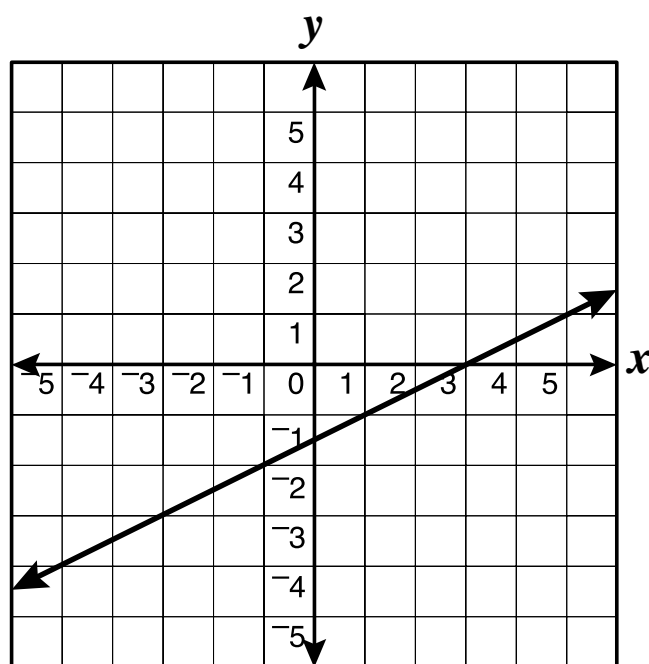**14 Which line has a slope of $\frac{1}{2}$ and *y*-intercept 3?**
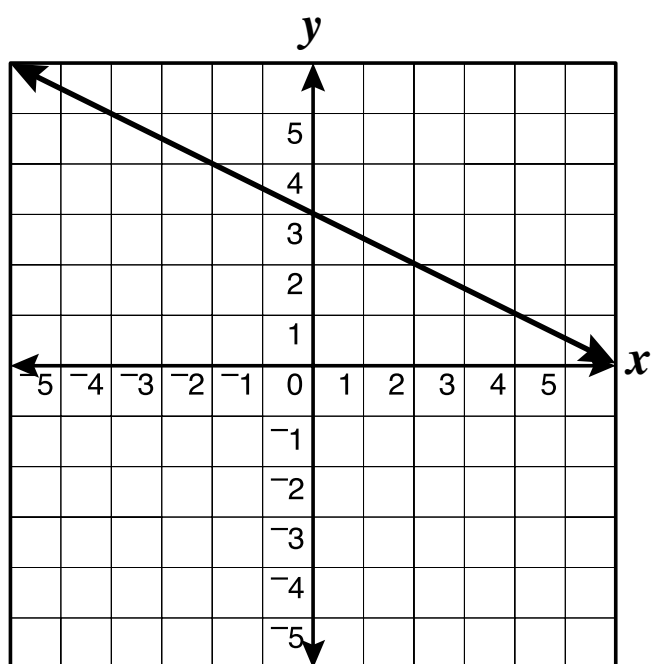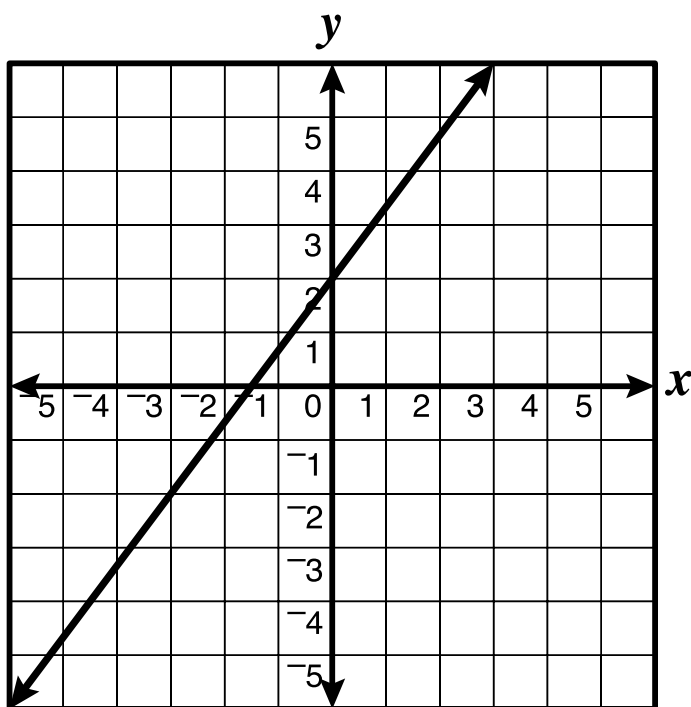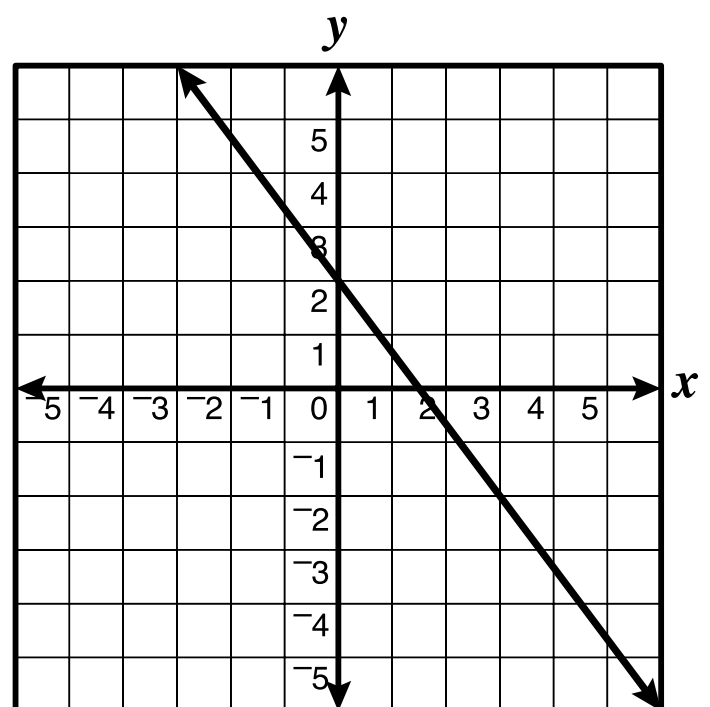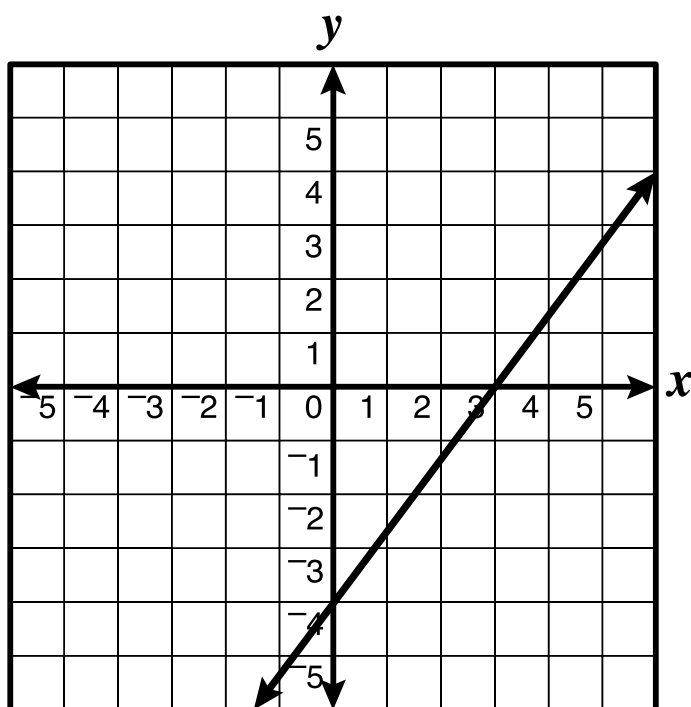
F

H

G

J

GO ON

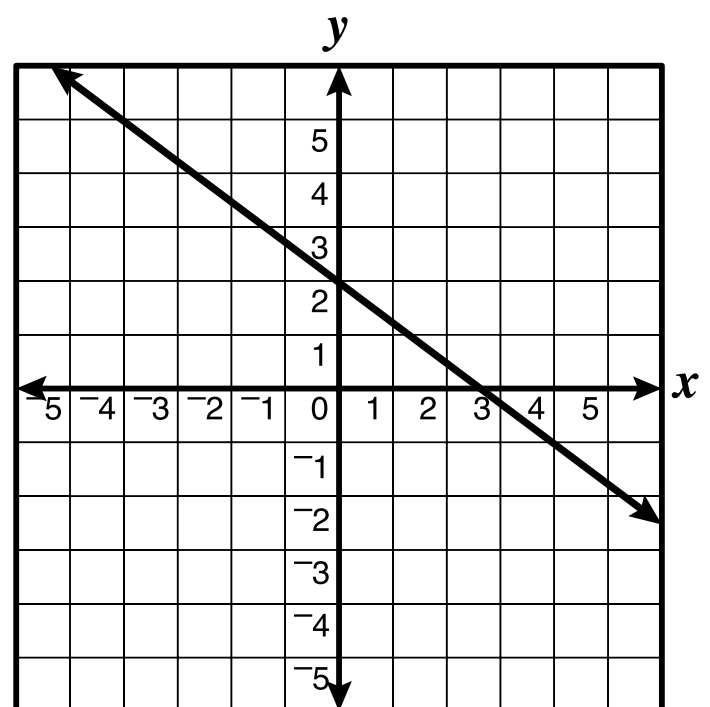**15** Which graph best represents the function $y = \dfrac{-4}{3}x + 2$?

A

C

B

D

GO ON

16 Which line has a negative slope?

F

G

H

J

GO ON
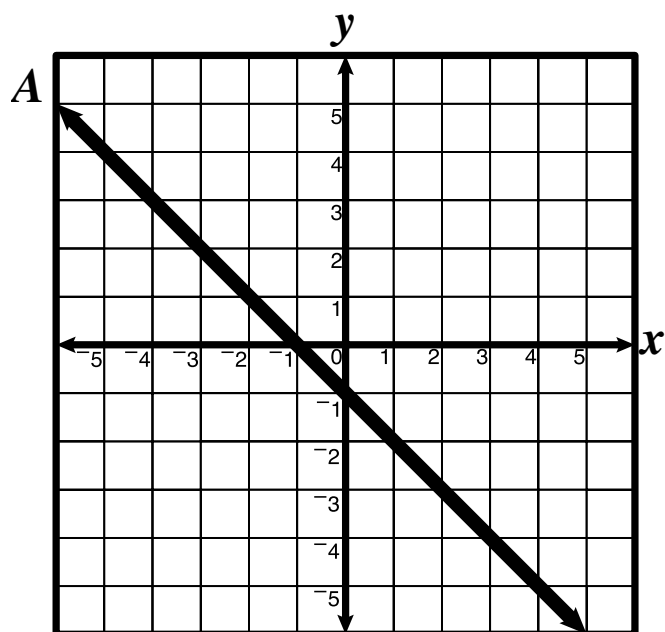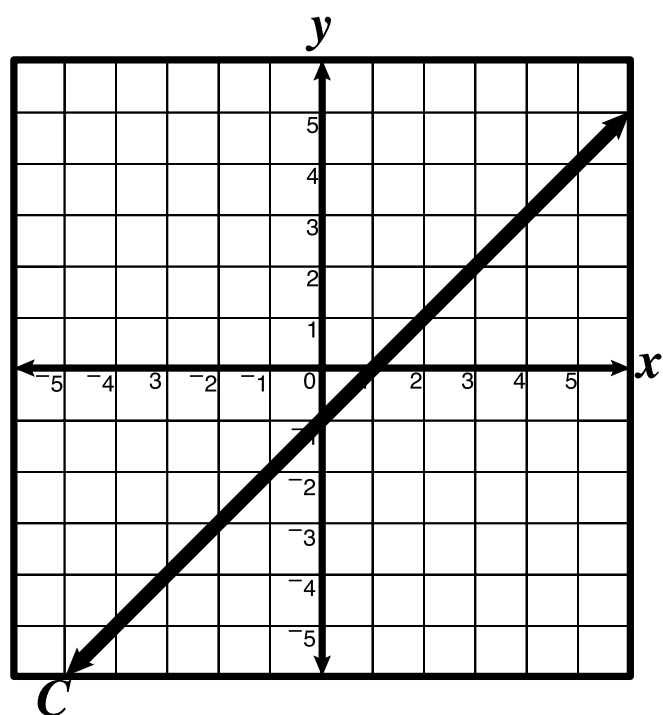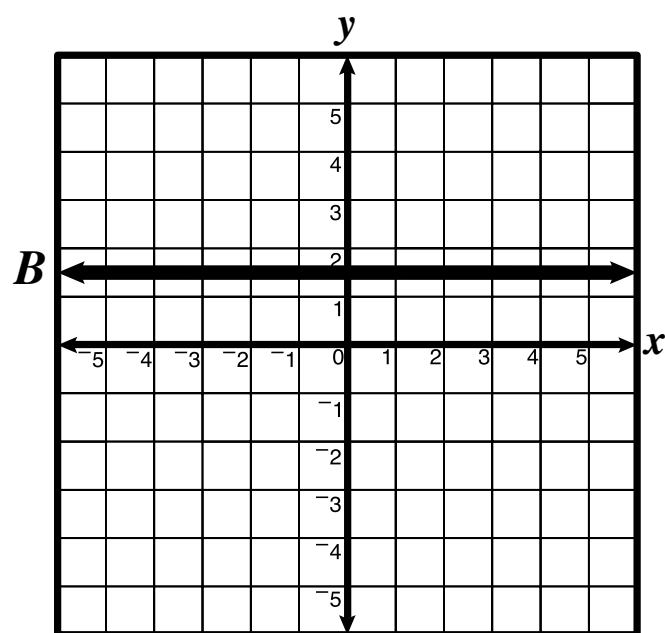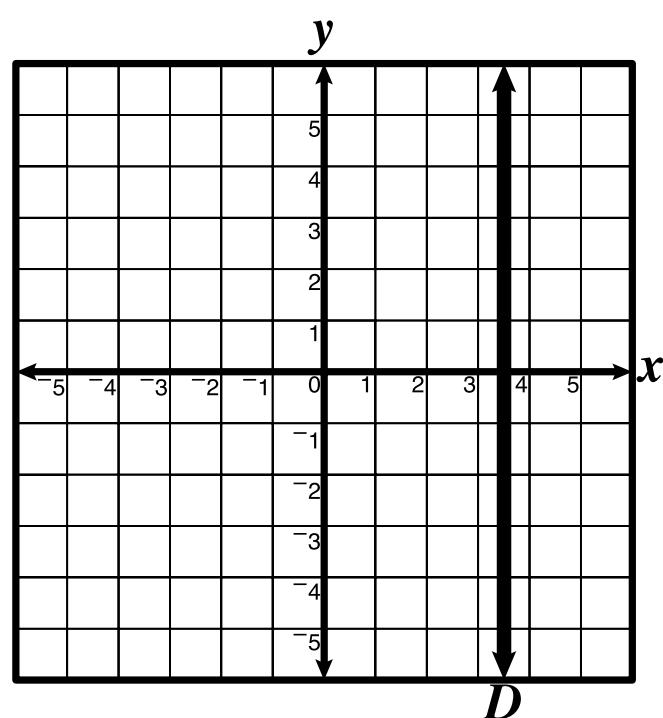
17 **What is the slope of the line that contains points (2, 3) and (2, ⁻4)?**

A   Undefined

B   0

C $\dfrac{^-1}{4}$

D   ⁻4

18 Which is an equation of a line that has a slope of $-\dfrac{1}{2}$ and contains the point $(2, 3)$?

F $\quad y = 2x - \dfrac{1}{2}$

G $\quad y = -\dfrac{x}{2} + 4$

H $\quad y = \dfrac{x}{2} + 3$

J $\quad y = 3x + 2$

19 **Which is an equation for the line that contains the points (⁻3, 5) and (1, ⁻3)?**

A $y = {}^-x + 2$

B $y = {}^-2x - 1$

C $y = -\dfrac{1}{2}x - \dfrac{3}{2}$

D $y = \dfrac{3}{2}x - \dfrac{9}{2}$

20 $\begin{cases} 2x - 6 = 2y \\ 3 - 2x = y \end{cases}$

What is the solution to this system of equations?

F $x = {}^-2,\ y = {}^-3$

G $x = 0,\ y = {}^-3$

H $x = 1,\ y = {}^-2$

J $x = 2,\ y = {}^-1$

21 Which is equivalent to $\dfrac{b^6}{b^2}$?

A $\dfrac{1}{b^3}$

B b^3

C b^4

D b^8

22 The continent of North America has an area of approximately 9.4×10^6 square miles. The area of Asia is approximately 1.74×10^7 square miles. How many square miles larger is Asia than North America?

F 7.6×10^1

G 7.6×10^{-1}

H 8.0×10^6

J 8.0×10^1

GO ON

23 **Which is equivalent to $(2x^2)^3$?**

A $8x^6$

B $6x^6$

C $8x^5$

D $6x^5$

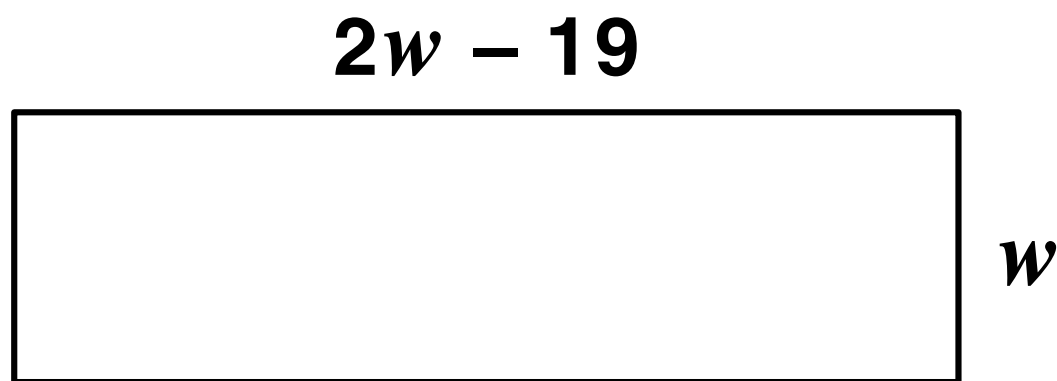**24** **Which is equivalent to $(5x^2 + 4x + 1) + (^-7x + 2)$?**

F $^-2x^2 + 6x + 1$

G $5x^2 - 3x - 1$

H $5x^2 - 3x + 3$

J $5x^2 + 11x + 3$

25 The length of a rectangular classroom floor is 19 feet less than twice the width.

$$2w - 19$$

w

Which expression represents the area of the classroom floor?

A $3w - 19$

B $6w - 38$

C $2w^2 - 19w$

D $2w^2 - 19$

GO ON

26 When completely factored, $4 - 16x + 28y$ equals

    F $4(1 - 4x + 7y)$

    G $4(1 - 4x) + 28y$

    H $(4 - 7y)(1 + 4x)$

    J $4 - 4(4x - 7y)$

27 When completely factored, $x^2 + x - 12$ equals

    A $(x + 3)(x - 4)$

    B $(x + 4)(x - 3)$

    C $(x + 7)(x - 5)$

    D $(x + 12)(x - 1)$

28 **Which is closest to the value of x if $x = 2\sqrt{7}$?**

    F   **3.2**

    G   **3.7**

    H   **5.3**

    J   **9.9**

29 $2x^2 - 3x + 1 = 0$

Which is the solution set for the equation above?

    A $\{^-2,\ ^-1\}$
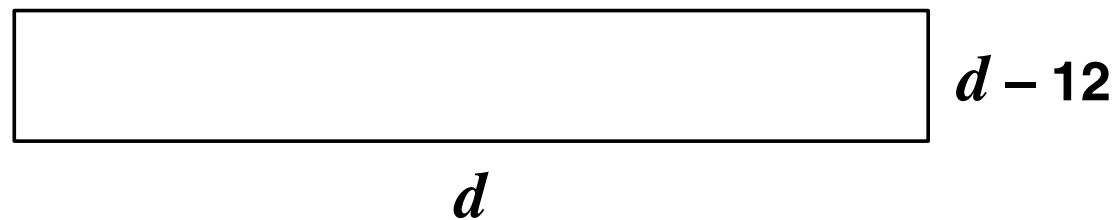
    B $\left\{^-1,\ \dfrac{^-1}{2}\right\}$

    C $\left\{\dfrac{1}{2},\ 1\right\}$
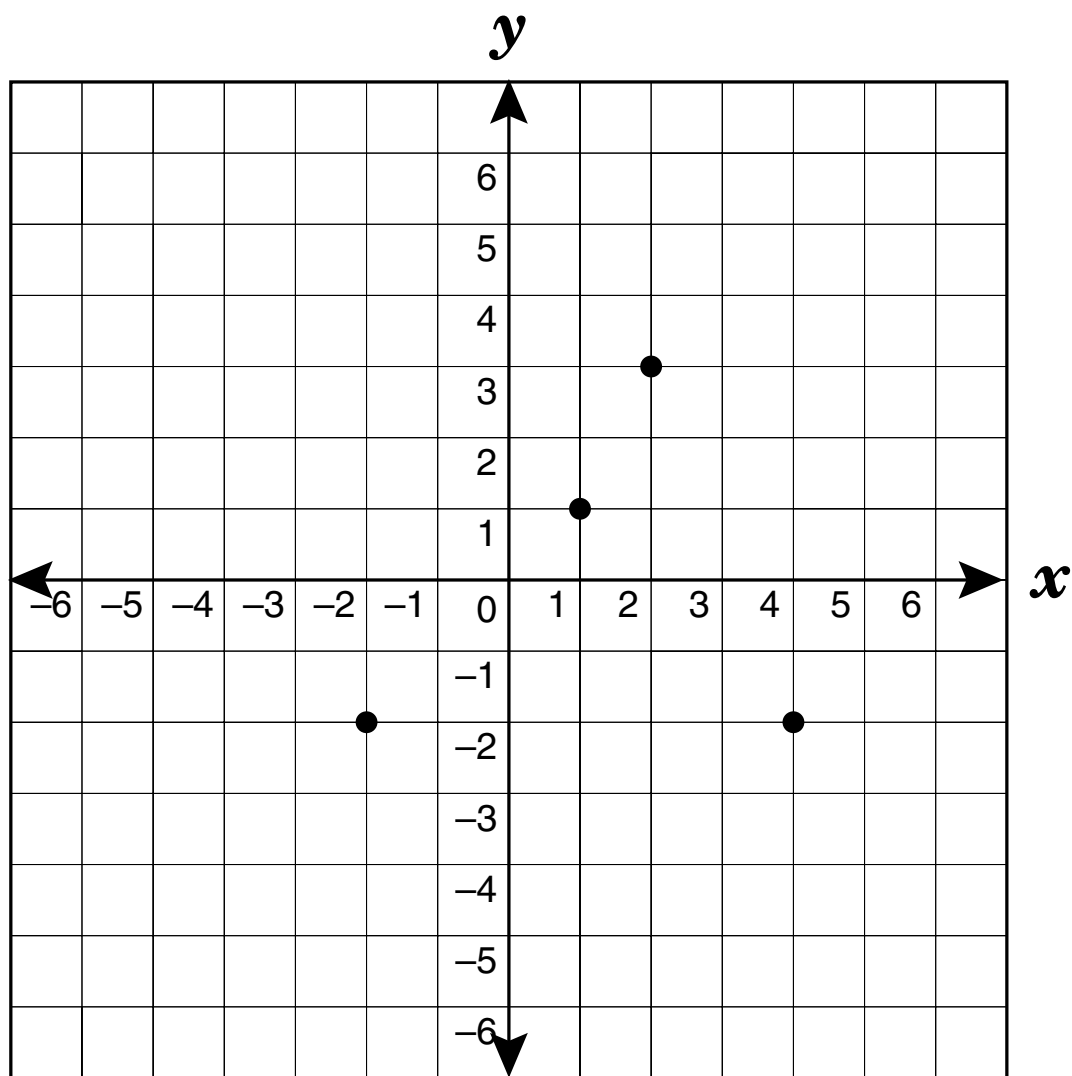
    D $\{2,\ 1\}$

30 The dimensions of a rectangle are shown in the drawing below.

$$d - 12$$

$$d$$

If the area is 28 square units, what is the value of d?

F   2 units

G   7 units

H   12 units

J   14 units

What is the range of the relation shown on the grid?

A   {⁻2, 1, 3}

B   {⁻2, 1, 2, 4}

C   {1, 2, 3, 4}

D   {⁻2, 2, 3, 4}

32 **What is the domain of the set of ordered pairs {(⁻5, ⁻4), (⁻4, 4), (2, 3), (4, 5)}?**

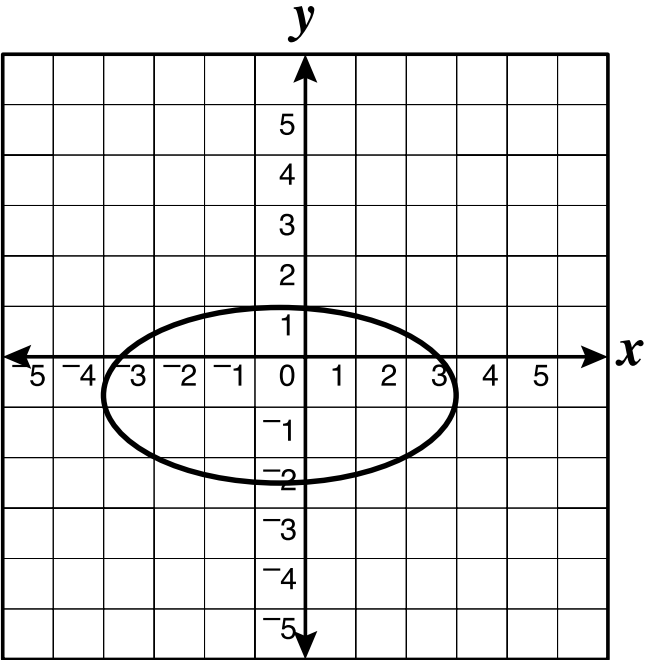F {⁻5, ⁻4, 2, 4}

G {⁻4, 3, 4, 5}

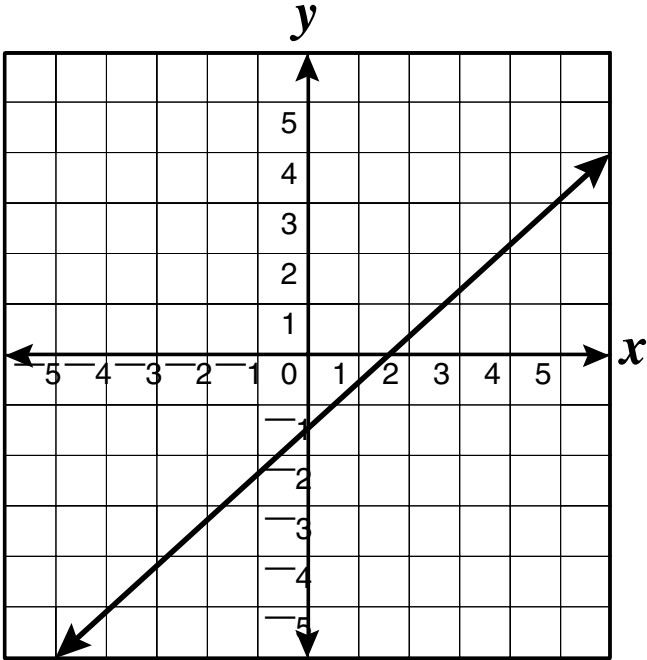H {⁻5, ⁻4, 4, 5}

J {⁻5, 2, 3, 4}

33 **Which of the following represents the graph of a function?**

A

C
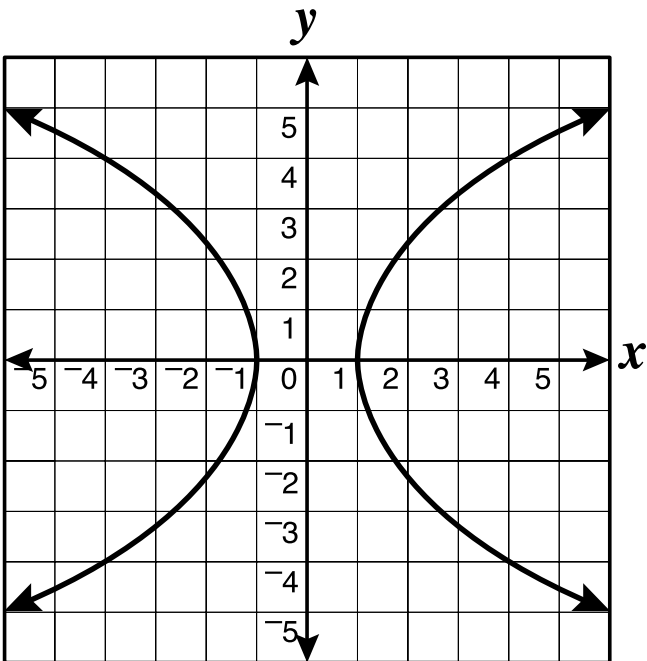
B
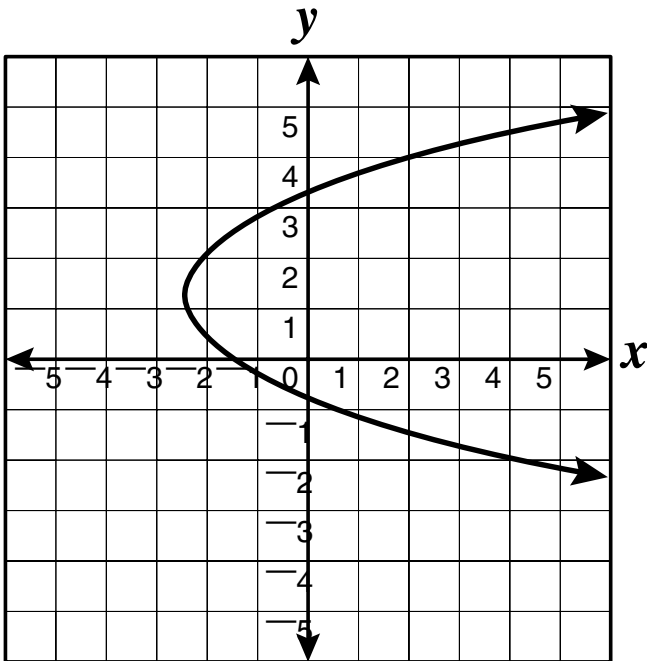
D

34 A lumber yard sells square scraps of plywood with sides varying from 1 foot to 4 feet. Ed wants to use some of these pieces to build storage cubes. The relationship between the length of the side of a cube and the volume of the cube is expressed by the function

$$f(x) = x^3$$

where x is a side of a cube. What is the range of this function in cubic feet for the domain given?

F Range varies from 1 to 64

G Range varies from 1 to 16

H {1, 64}

J {1, 16}

35 What is the range of the function $\frac{1}{2}x + 5$ when the domain is {2, 4, 6}?

A {⁻6, ⁻2, 2}

B {6, 7, 8}

C {2, 4, 6}

D {1, 3, 5}

36 If $f(x) = 2x - 5$, then what is $f(10)$?

F 5

G 7.5

H 15

J 25

37 Carol went on a 5-day bicycle trip. She rode 23 miles the first day, 22 miles the second, 21 miles the third, 17 miles the fourth, and 17 miles the fifth day. What was the mean number of miles per day that Carol rode on her 5-day bicycle trip?

A   6 mi.

B   20 mi.

C   21 mi.

D   23 mi.

GO ON

38 The stem-and-leaf plot shows the results of a science experiment in which 12 plants were each given a different combination of water and nutrients over a period of time and their growth in millimeters measured.

Millimeters Growth

0	8
1	2,4,4,4,5,7,8
2	2,4,6
3	1

What was the median number of millimeters of growth?

F   14

G   15

H   16

J   17

39 The gas pressure in a chamber varies directly with the temperature in the chamber. If the pressure in the chamber is 150 atmospheres (atm) when the chamber is at 50° F, what is the pressure in the chamber when the temperature of the chamber is 75° F?

A   175 atm

B   200 atm

C   225 atm

D   275 atm

40 If *a* varies directly as *b* and *a* = 3 when *b* = 12, what is the value of *a* when *b* = 18?

F $\dfrac{1}{4}$

G 4

H 4.5

J 72

Answer Key

Test Sequence Number	Correct Answer
1	D
2	F
3	B
4	H
5	D
6	J
7	A
8	G
9	B
10	G
11	C
12	J
13	C
14	H
15	C
16	F
17	A
18	G
19	B
20	J
21	C
22	H
23	A
24	H
25	C
26	F
27	B
28	H
29	C
30	J
31	A
32	F
33	C
34	F
35	B
36	H
37	B
38	H
39	C
40	H